

**REMARKS/ARGUMENTS**

This case has been carefully reviewed and analyzed in view of the Official Action dated 26 November 2004. Responsive to the rejections made in the Official Action, Claim 1 has been amended to clarify the combination of elements which form the invention of the subject Patent Application and Claim 4 has been cancelled by this Amendment. Additionally, new Claim 5 has been added.

In the Official Action, the Examiner rejected Claims 1 – 4 under 35 U.S.C. § 103(a), as being unpatentable over Chi et al., U.S. Patent Application Publication 2004/0089864, in view of Soules et al., U.S. Patent No. 6,252,254. The Examiner stated that the Chi reference disclosed a white light source comprising an insulating substrate, a green LED and a blue LED on the substrate, and mixed with red and yellow dual color light. The Examiner admits that the reference does not disclose red and yellow produced from phosphorescent glue. However, the Examiner then refers to the Soules et al. reference as disclosing red and yellow phosphor layers which can be applied to an LED.

Before discussing the prior art relied upon by the Examiner, it is believed beneficial to first briefly review the structure of the invention of the subject Patent Application, as now claimed. The invention of the subject Patent Application is directed to a white light source which includes an insulating substrate, a green LED and a blue LED mounted on the insulating substrate. The white light source also includes a red color phosphorescent glue and a yellow color phosphorescent

glue covering the green LED and the blue LED, such that the light emitted from the red phosphorescent glue and yellow phosphorescent glue is colorless. The red phosphorescent glue has a color spectrum defined by an approximate wavelength bandwidth of 550 nm to 730 nm, so that the overall spectral response of the source approaches that of natural light. As further defined in Claim 5, the yellow phosphorescent glue has a color spectrum defined by an approximate wavelength bandwidth of 534 nm to 608 nm. The invention of the subject Patent Application thereby produces a white light which found in nature through the use of phosphors which have a very wide wavelength bandwidth, so that the total bandwidth of the emission is close to that found for white light in nature.

In contradistinction, the Chi et al. reference is directed to a light emitting diode having an active layer 30 formed by a combination of aluminum, gallium, indium, phosphorus compositions wherein the aluminum content is varied to produce multiple quantum wells with different transition energy levels within the active layer to produce light of different wavelengths, the combination of those wavelengths producing a white light source, paragraphs 22 – 23. Therefore, the reference teaches a single LED structure which produces white light, rather than combining multiple discreet light emitting diodes and/or diodes and a phosphorescent composition. Thus, the reference clearly teaches away from the structure of the invention of the subject Patent Application. As the reference uses only band-gap principles to produce white light, it suffers the problems as light

sources formed by combining multiple discreet light emitting diodes of different colors. As discussed in the background of the subject Patent Application, white light produced by combining LEDs of different colored emissions has the characteristic that the bandwidth of each color is very narrow, and thus the white light does not have a color temperature that is like that of natural white light, which is also true for the light source of Chi et al.

The Soules et al. reference does not overcome the deficiencies of Chi et al., and is not properly combinable with Chi et al. as well. It is respectfully submitted that the Chi et al. reference is directed to a light emitting diode structure wherein a single diode produces white light by providing an active layer having a multiple quantum wells with different transition energy levels to produce light of different wavelengths from the one active layer. Thus, the reference clearly teaches away from a light source structure utilizing multiple light emitting diodes and/or light emitting diodes with externally applied phosphorescent compositions. That teaching away is clearly evidenced by the discussion of the failings of such structures in paragraphs 3 and 4, and in particular structures with phosphorescent compositions are considered disadvantageous in paragraphs 3 - 6. Therefore, one skilled in the art would not consider combining the disclosures of Chi et al. with that of Soules et al., as such is directly counter to the teachings of Chi et al.

Arguendo, even if Soules et al. could properly be combined with Chi et al., such still does not make obvious the invention of the subject Patent Application, as

now claimed. The Soules et al. reference is directed to a light emitting device which combines the light emitting diode 12 with an overlaying phosphor containing layer 14. In particular, the reference discloses a blue light emitting diode over which a combination of yellow and red phosphors are applied, the phosphors being blended together as a mixture, column 5, line 64 – column 6, line 5. Nowhere does the reference disclose or suggest the red phosphorescent glue having an approximate wavelength bandwidth of 550 nm to 730 nm to provide an overall spectral response of the light source to approach that of natural white light. Still further, as defined in new Claim 5, the reference fails to disclose or suggest the yellow phosphorescent glue having a color spectrum defined by an approximate wavelength bandwidth of 534 nm to 608 nm.

Thus, even if Soules et al. were combined with Chi et al., such still does not make obvious the invention of the subject Patent Application which utilizes phosphorescent glues having a wide bandwidth to provide an emission spectrum of the source that approaches that of natural white light.

MR2349-1104

Serial Number 10/677,783

Response to Official Action dated 26 November 2004

Therefore, it is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,  
For: ROSENBERG, KLEIN & LEE



David I. Klein  
Registration No. 33,253

Dated: 23 Feb 2005

Rosenberg, Klein & Lee  
Suite 101  
3458 Ellicott Center Drive  
Ellicott City, MD 21043  
410-465-6678

Customer No.  
04586